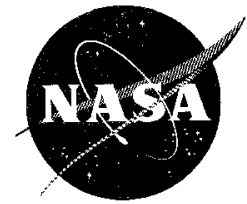


# NASA Facts

National Aeronautics and  
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## Space Experiment Module SEM-04

The Space Experiment Module program was designed to give students from kindergarten through college access to space. As an educational program, the Space Experiment Module gives students the opportunity to design their own experiments to be flown in space. Such experiments can be either passive or active.

**“The Effect of Microgravity and Temperature on Human Tissue and Human Used and Consumed Items” - Blue Mountain School, Floyd, VA.**

Second to seventh grade students will study the effect of microgravity and temperature on film, soap, motor oil, bone, nails, cola beverages and popcorn. The investigation will enhance their study of the effects of microgravity on the human body and the development of products for use in space.

**“The Effects of Microgravity on Surface Tension” - Glenbrook North High School, Northbrook, IL**

The objective of the Surface Tension Experiment is to provide information about the motion patterns, mass and energy loss, cohesion and adhesion properties, and mixing ability of immiscible and non-immiscible materials. A syringe system will apply color coded non-toxic water-based dyes and non-toxic, non-water based paints to different

types of non-toxic paper. The papers will be examined postflight.

**“Effects of Microgravity on an Object’s Physical Characteristics” - Dowell Elementary School, Marietta, GA.**

First grade students will compare the weight, mass, and other physical characteristics of objects prior to and after the objects’ spaceflight. Experiment items to be included on the Shuttle flight include chewing gum (elasticity, mass), popcorn (number that will pop), bread (observing mold), stickers (response of the adhesive), bubble wrap (inflation/deflation of individual bubbles), chalk (vibration, crumbling), paper clips (weight, mass), erasers (weight, mass, performance), and crayons (temperature effects).

**“The Effect of Cosmic Radiation on Wisconsin Fast Plants and the Development of Brine Shrimp Eggs and Chia Seeds” - Fort Couch Middle School, Upper St. Clair, PA. and Monrovia Elementary School, Madison, AL.**

The fifth to eighth grade students will look at the effect of cosmic radiation on Wisconsin fast plants (plant brassica), wheat seeds, brine shrimp and chia seeds. Germination rate, crossover rate, lifespan, and changes in DNA will be specifically examined. The investigation will support the students’ devel-

opmental biology, genetics, and animal behavior curriculum.

**“Growing 'Montello' Transglobally” - Montello High School, Montello, WI. and Istituto Tecnico Commerciale “Riccati”, Treviso, Italy**

This project has been designed by a joint venture of high school students and staff from two sites: Montello, WI. and the area of Montello, Italy. Students will study lettuce and cicoria seeds. Project analysis will include observing plant size, plant vigor, bloom size and productivity. The two transglobal sites will compare data by exchange of seed samples, pictures, graphs, charts, diagrams and journals via the Internet.

**“Analysis of Three-Dimensional Sprag Performance in a Microgravity Environment” - University of Maryland, College Park, MD.**

This innovative three-dimensional sprag was developed by Goddard Space Flight Center engineer John Vranish. Sprags are small parts manufactured with specialized geometry to allow free rolling in one direction and prevent motion in the other direction. Simply put, the sprag's job is to lock a cog or wheel in place so that it moves in only one direction. The students will be testing and verifying the sprag's performance in-flight. As a spaceflight and commercial tool, the potential value of the sprag design includes more efficient use of extravehicular activity resources, including human workload, the ability to use wrenches in more confined spaces and presence of a tool that requires no lubrication and can stay in space indefinitely.

**“The Effect of Microgravity and Temperature on Mold Growth” - West Richland Elementary School, Noble, IL.**

Kindergarten through sixth grade students will study the effect of microgravity and temperature on a variety of bread molds. Students will measure and compare growth diameter, depth and weight of controlled and microgravity-exposed mold cultures.

**The Effect of Microgravity on Seed Growth and Survival - Woodmore Elementary School, Mitchellville, MD. and Colegio Santa Hilda, Buenos Aires, Argentina**

The elementary school students in both Maryland and Argentina will study the effects of radiation exposure on seed germination and growth. They will harvest seeds from the first generation of plants, and repeat the germination and growth study for the second generation of seeds. Experiment data and results will be exchanged between the two schools. A variety of seeds (including Perennial Rye, Kentucky Bluegrass, Black Eyed Susan, corn, oats, barley, lentil, and sunflower) will be investigated. The collaboration between the two schools is designed to stimulate and enhance the student cultural exchange.

Dr. Ruthan Lewis of the Shuttle Small Payloads Project at Goddard Space Flight Center in Greenbelt, MD. is the mission manager for the payload. Find more information on the Shuttle Small Payloads Project at <http://sspp.gsfc.nasa.gov/sem/sem.html>.